

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding all or a substantial portion of an *Arabidopsis thaliana*-like sugar transport protein comprising a member selected from the group consisting of:
  - (a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14 and 16;
  - (b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14 and 16; and
  - (c) an isolated nucleic acid fragment that is complementary to (a) or (b).
2. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises all or a portion of the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13 and 15.
3. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.
4. A transformed host cell comprising the chimeric gene of Claim 3.
5. An *Arabidopsis thaliana*-like sugar transport protein polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14 and 16.
6. An isolated nucleic acid fragment encoding all or a substantial portion of an *Beta vulgaris*-like sugar transport protein comprising a member selected from the group consisting of:
  - (a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:18, 20, 22, 24, 26 and 28;
  - (b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:18, 20, 22, 24, 26 and 28; and
  - (c) an isolated nucleic acid fragment that is complementary to (a) or (b).
7. The isolated nucleic acid fragment of Claim 6 wherein the nucleotide sequence of the fragment comprises all or a portion of the sequence set forth in a member selected from the group consisting of SEQ ID NO:17, 19, 21, 23, 25 and 27.
8. A chimeric gene comprising the nucleic acid fragment of Claim 6 operably linked to suitable regulatory sequences.
9. A transformed host cell comprising the chimeric gene of Claim 8.

10. An *Beta vulgaris* sugar transport protein polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:18, 20, 22, 24, 26 and 28.

5 11. A method of altering the level of expression of a sugar transport protein in a host cell comprising:

- (a) transforming a host cell with the chimeric gene of any of Claims 3 and 8; and
- (b) growing the transformed host cell produced in step (a) under conditions that are suitable for expression of the chimeric gene

10 wherein expression of the chimeric gene results in production of altered levels of a sugar transport protein in the transformed host cell.

12. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a sugar transport protein comprising:

- 15 (a) probing a cDNA or genomic library with the nucleic acid fragment of any of Claims 1 and 6;
- (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of any of Claims 1 and 6;
- (c) isolating the DNA clone identified in step (b); and
- 20 (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)

wherein the sequenced nucleic acid fragment encodes all or a substantial portion of the amino acid sequence encoding a sugar transport protein.

13. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding a sugar transport protein comprising:

- 25 (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOs:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25 and 27; and
- (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences
- 30 of the cloning vector

wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding a sugar transport protein.

14. The product of the method of Claim 12.

15. The product of the method of Claim 13.

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